

31 transducer signals, adds the delayed signals, and provides the summed signal to one receive beamformer channel 225i. Alternatively, one intra-group receive processor provides the summed signal to several receive beamformer channels 225i of a parallel receive beamformer. The parallel receive beamformer is constructed to synthesize several receive beams simultaneously. Each intra-group receive pre-processor 220i may also include several summing delay lines (or groups of programmable delay elements with each group connected to a summing junction) for receiving signals from several points simultaneously, as described in detail in U.S. Patent 5,997,479, which is incorporated by reference.

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Paragraph beginning on page 24, line 20:

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32 Control processor 140 selects the scanning sequence performed by beamformer 200. The transmit beamformer directs emission of the phased ultrasound beam along the scan lines over the ranges calculated for each sector. For each emitted scan line, the receive beamformer phases the transducer elements to detect the ultrasound echoes along a corresponding receive scan line. Alternatively, the receive beamformer synthesizes the scan data from several receive scan lines that are spaced over a selected angular distribution as is described, for example, in the U.S. Patent 5,976,089, entitled "Increasing the Frame Rate of a Phased Array Imaging System," which is incorporated by reference. The RF data is filtered by a filter with a pass band of as much as 60% around the center frequency of as high as 10 MHz, or preferably a pass band of about 35% around the center frequency in the range of about 5 MHz to 7 MHz.

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Paragraph beginning on page 25, line 14:

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B3 Referring to Figs. 5(1)-5(5), the receive beamformer 200B provides detected RF echo 15 signals to the image generator that includes a time gain compensator (TGC) 262, a lateral gain compensator (LGC) 264, and an elevation gain compensator (EGC) 266, which perform the corrections described above. The EGC 266 provides the compensated data to a B-scan signal processor 272, a C-scan signal processor 315, and

33 boundary detectors 302 and 322.

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Paragraph beginning on page 25, line 28:

34 Referring still to Figs. 5(1)-5(5), the image generator includes post processors 276 and 318, which receive filtered and compensated data from envelope detectors 274 and 317. Post processors 276 and 318 control the contrast of each data point by mapping the data onto a set of selected curves. After assigning a contrast level to each data point, a scan line buffer may be used to hold temporarily the data for one scan line.

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Paragraph beginning on page 27, line 16:

35 As shown in Figs. 5(1)-5(5), B-scan boundary detector 302 includes a signal processor 304, a tissue indicator 306, a majority vote processor 308, and an edge indicator 310. U.S. Pat. 5,195,521, which is incorporated by reference, discloses a majority vote circuit and circuits for generating the ROI. Control processor 140 provides to boundary detector 302 ROI enable output 176, line number output 171, and sector number output 174. Signal processor 304 derives from the RF data a characteristic sensitive to the difference between the echo from tissue and from blood in order to increase the accuracy of locating the tissue boundary. The characteristic is the amplitude of integrated backscatter from tissue and from blood. Signal processor 304 determines the amplitude of the integrated backscatter and provides it to tissue indicator 306. (Alternatively, tissue indicator 306 may receive the echo RF data directly.)

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Paragraph beginning on page 30, line 32:

36 The imaging system 10 uses several icons to provide understandable images. Referring to Figs. 5(1)-5(5), 5A(1)-5A(2), and 7, an azimuthal icon generator 289 receives a pitch adjustment 181 and provides data for displaying a front azimuthal icon 370 for the front view (or a rear azimuthal icon for the rear view). An elevation icon generator 299 receives a roll adjustment 182 and provides data for displaying a left elevation icon 372 (shown in Fig. 7) for the left view 291 and a right elevation icon 374 for the right